Endoscopic Instruments and Procedures

Mr. Martinez ,CST

Definitions and Purposes of Endoscopic Procedures

Endoscope

A tube that is inserted into a natural body orifice or through a tiny incision to access internal organs or structures.

Endoscopes are commonly called “scopes”.

Endoscope and Camera

Endoscopy

Use of a device consisting of a tube and optical system for the purpose of observing the inside of a cavity or hollow organ.

Endoscopies may be performed in traditional operating rooms, ambulatory surgery settings, clinics, radiology and other areas where surgery can be performed.

Endoscopic surgery is also called Minimally Invasive Surgery (MIS).

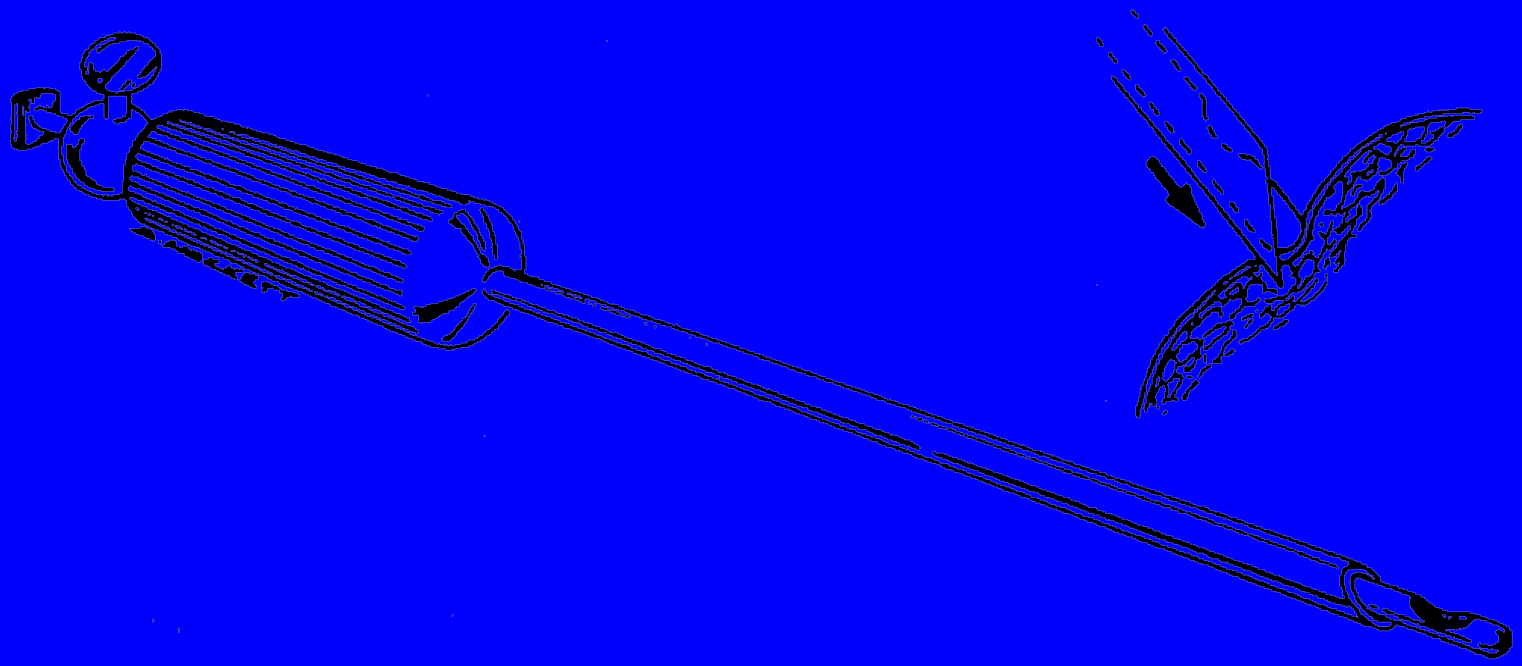
Insufflate

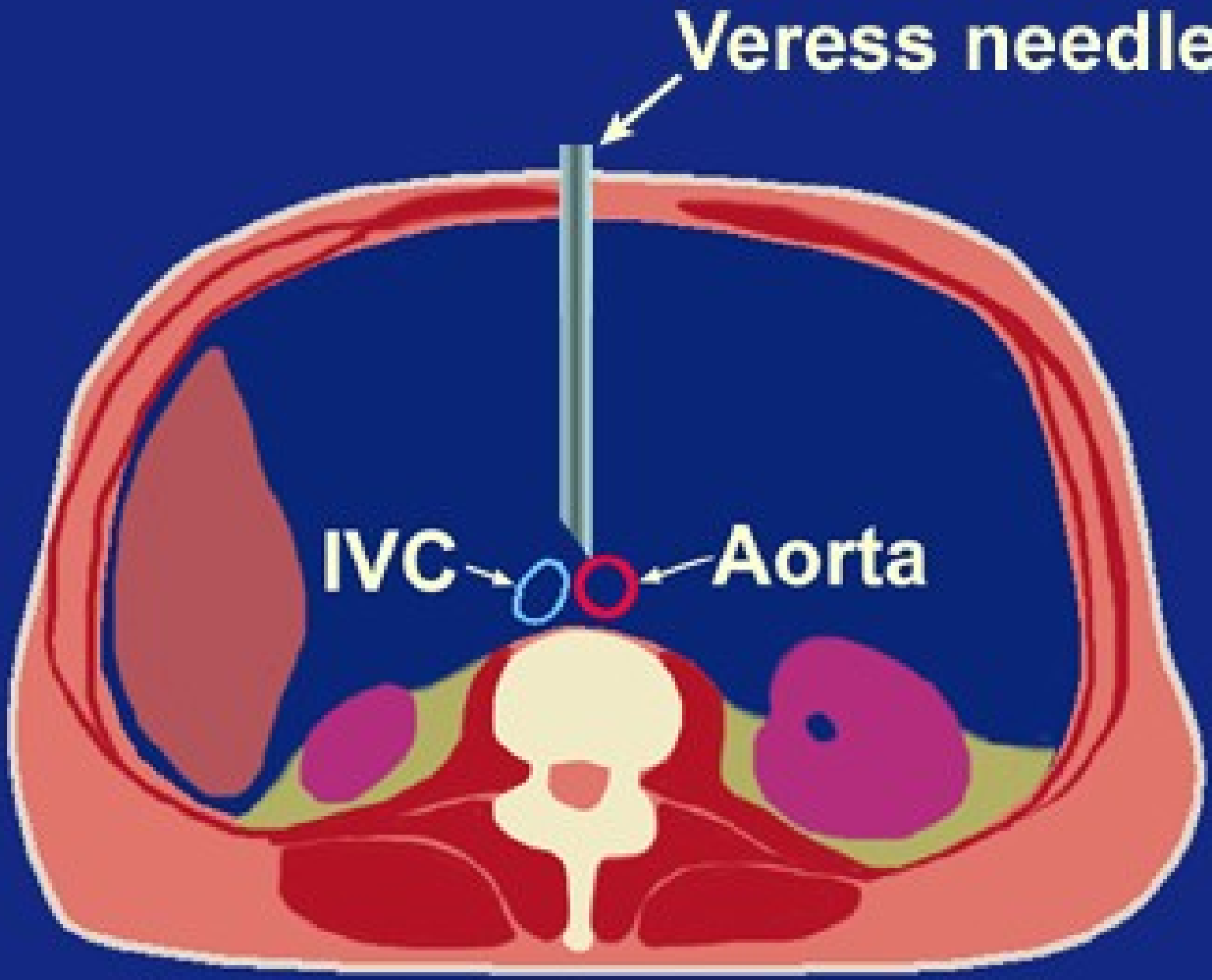
To enlarge a cavity allowing for visualization of the contents while maintaining a preset pressure within the cavity.

Pneumoperitoneum

Air or gas (Co2) collected in the peritoneal cavity.

Veress Needle




Veress needle
IVC
Aorta

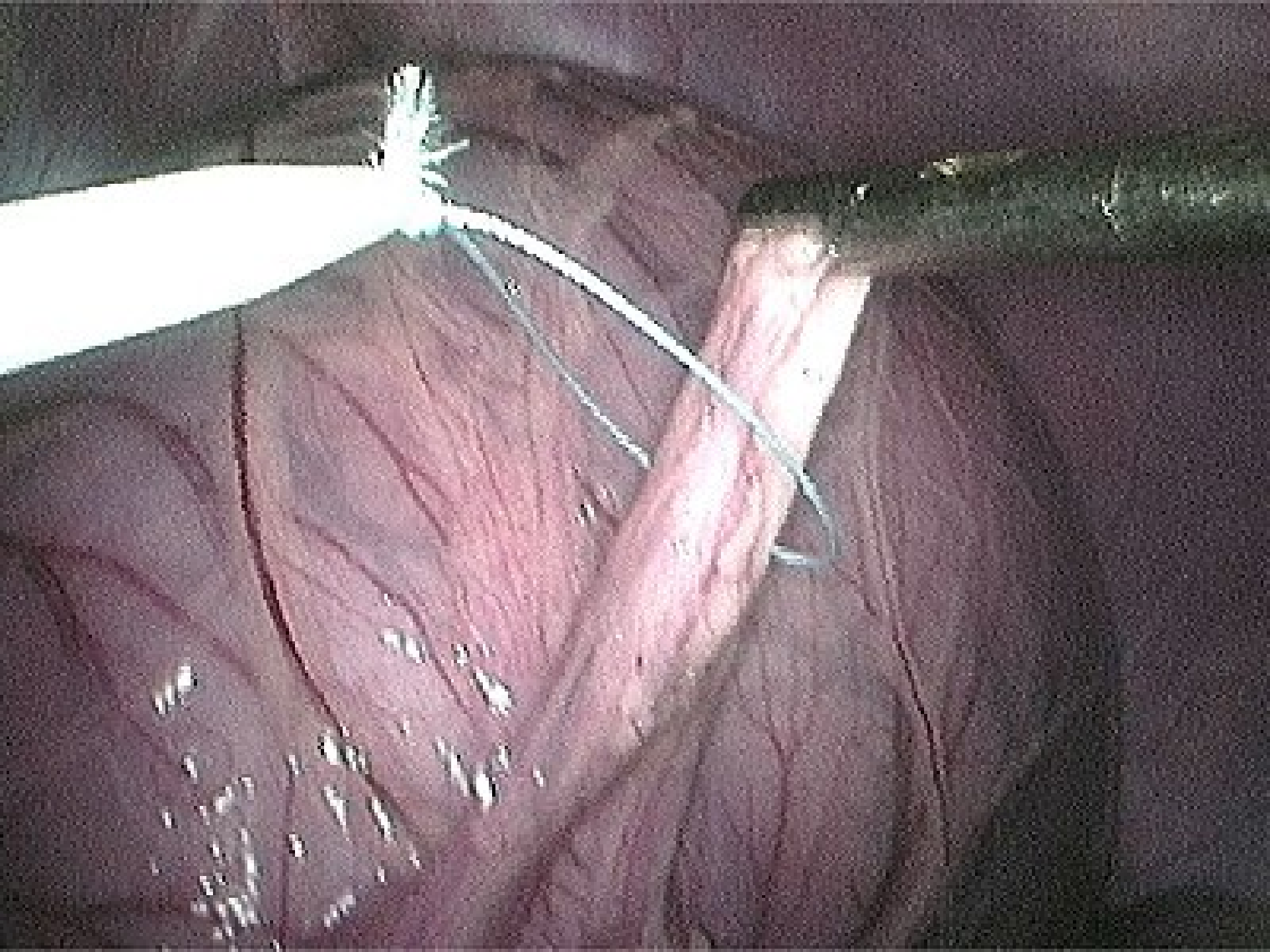
Purposes of Endoscopic Procedures

a. To examine an organ or area in order to make a preliminary diagnosis or to confirm a suspected diagnosis.

b. To obtain specimens.

c. To remove foreign bodies.

d. To excise or cauterize tissue, polyps, or growths.



Methods of Endoscopic Observation

Endoscopes can be inserted through natural body openings.

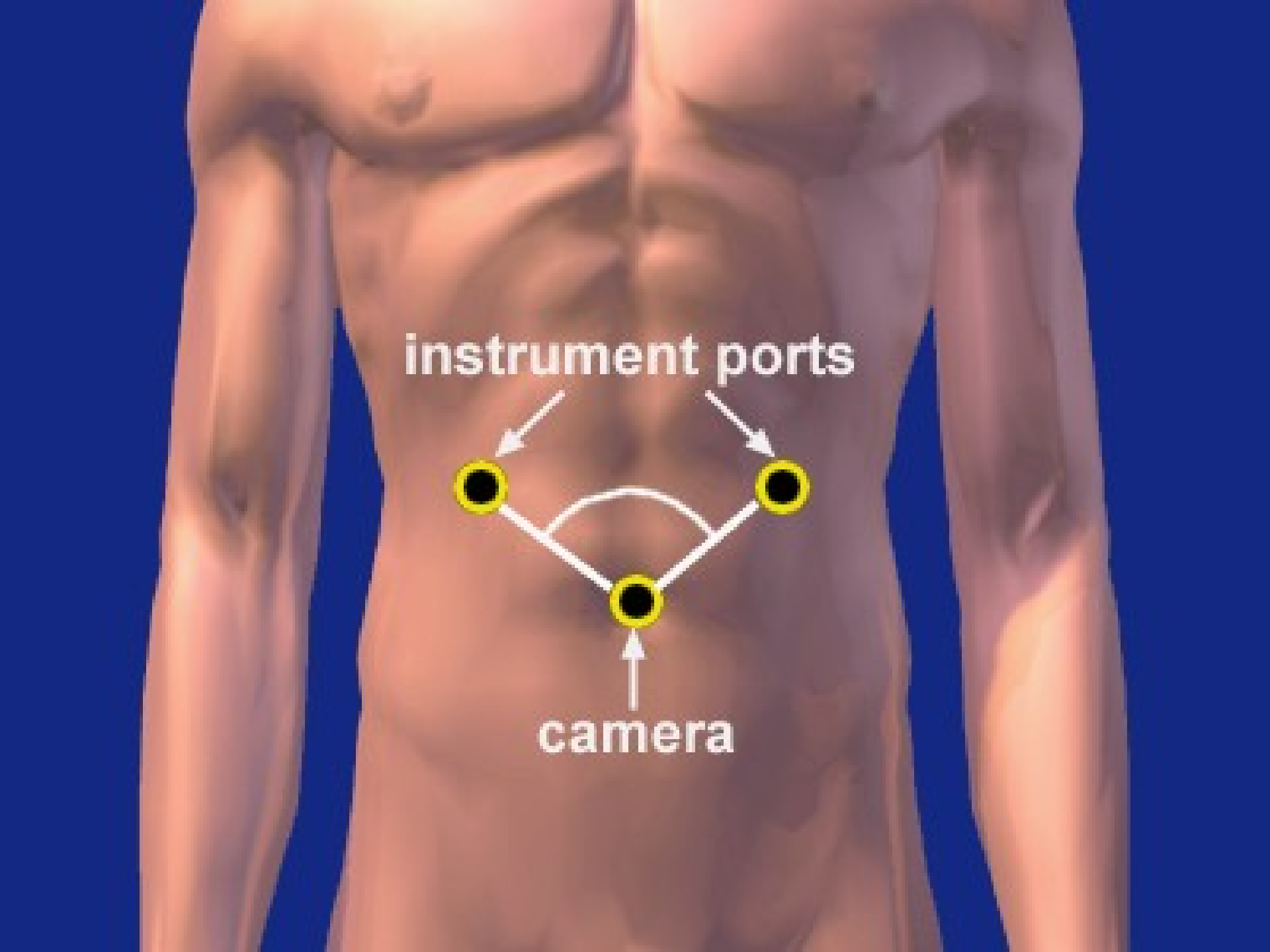
a. Rectum (Procto,Sigmo)

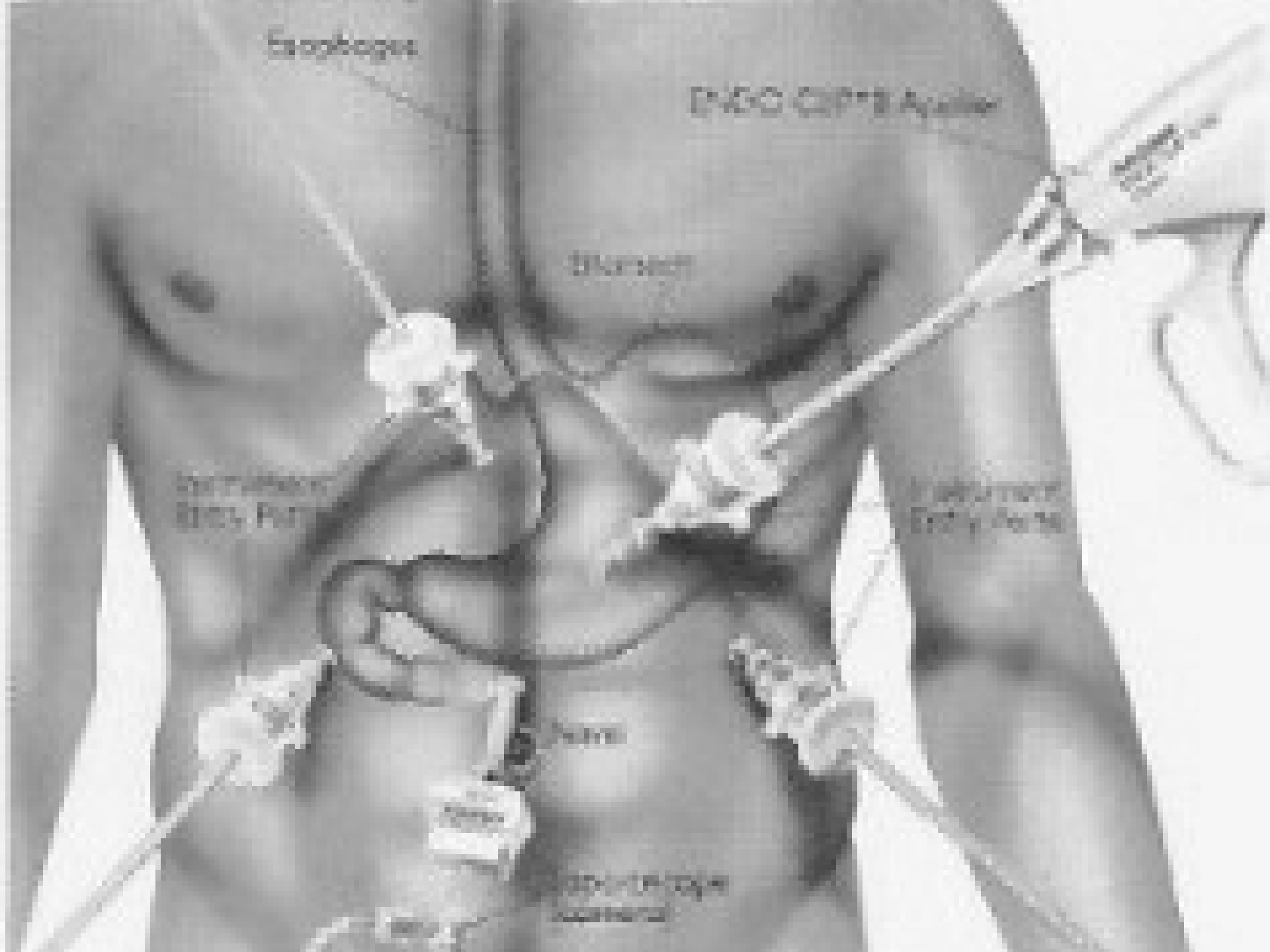
b. Mouth (Laryngo,Broncho)

c. Urethra (Cystoscopy)

d. Cervix (Hysteroscopy)

Endoscopes may be inserted through small incisions into body cavities, usually called “keyhole” or “bandaid” surgery.


instrument ports
camera



a. Abdomen (Laparoscopy)
b. Knee/Shoulder Joint

(Arthroscopy)
c. Chest (Thoracoscopy)
d. Head (Ventriculoscopy)
e. Sinuses (FESS)

Open vs Endoscopic Surgery

Open surgery requires an incision into body tissues or into a body cavity.

Advantages of open surgery (also called invasive surgery)

a. Large incision allows for good visualization of the inside of the body.

b. Faster and easier access during emergency procedures.

c. Some open procedures are completed more quickly than endoscopic ones. Not all surgical procedures have been perfected using an endoscopic method.

Advantages of endoscopic surgery:

a. Visualization of the inside of the body without the need for large incisions.

b. Prevents unnecessary invasive surgery. Diagnostic procedures can be performed for a definitive Dx.

c. Patient experiences less pain

(1) Decreased trauma to major tissue/systems.

(2) Reduced need for pain medications.

d. Less time spent in bed after the procedure - fewer postoperative pulmonary and gastrointestinal complications and stronger blood circulation.

e. Lower risk of postoperative infections.

f. Patient has quicker recovery - faster return to full activity and diet.

g. Cosmetically appealing (3 or 4 small incisions instead of 1 large one).

Today, 95% of gallbladder removals are accomplished laparoscopicly.

Disadvantages of open (invasive) surgery.

a. Hospital admission/stay often required.

b. Four to six week recuperation.

c. Postoperative pain related to surgical incision.

Disadvantages of endoscopy

a. Equipment is complex - O.R. Staff must become proficient in operating multi-component equipment systems.

b. O.R. staff must continually

be educated to keep up with technical advances.

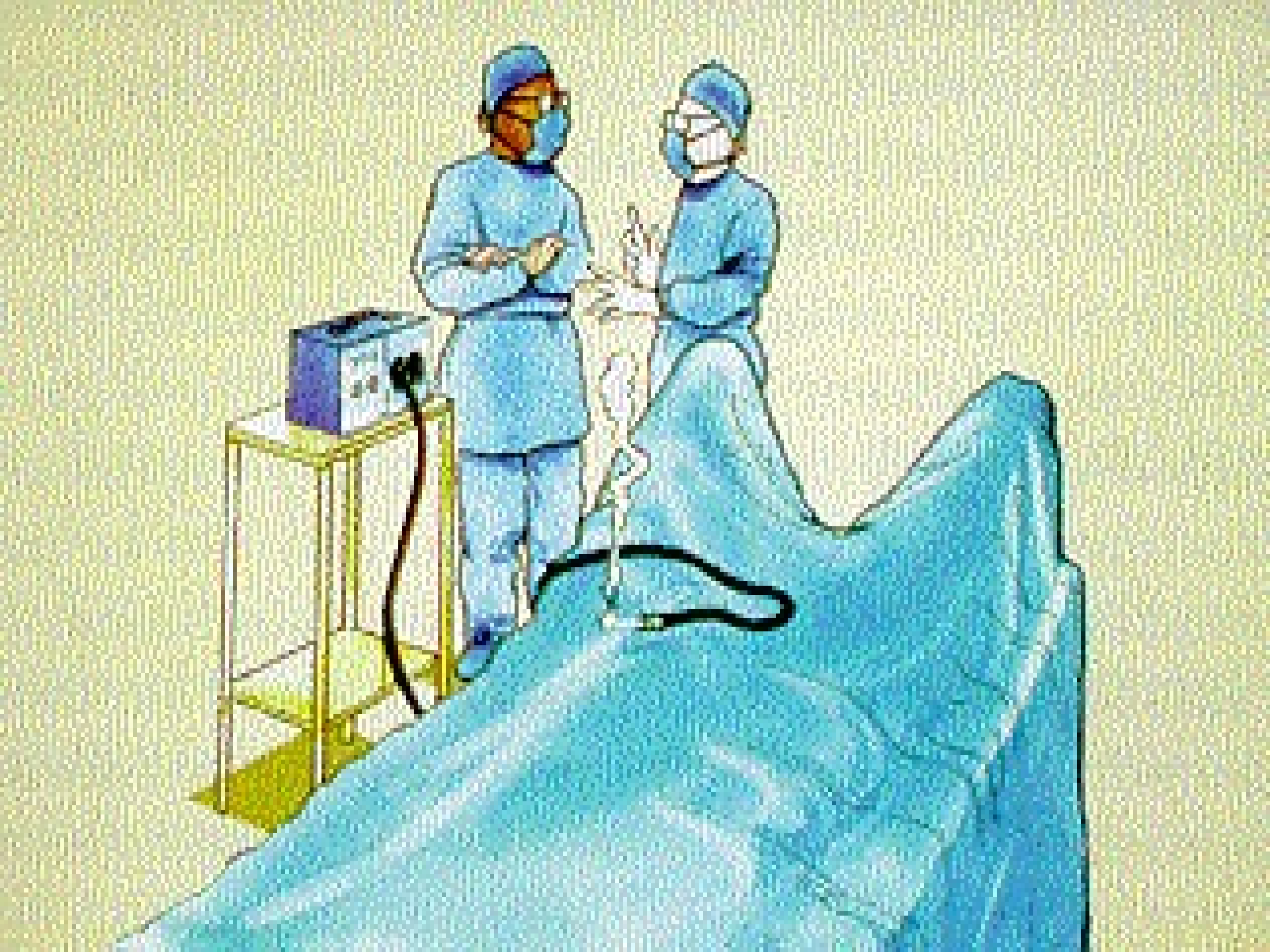
c. Extensive equipment systems require careful maintenance, cleaning and monitoring during use, and are expensive to purchase and repair.

d. Intraoperative complications

are very severe when they occur and most will require open surgery on the patient.

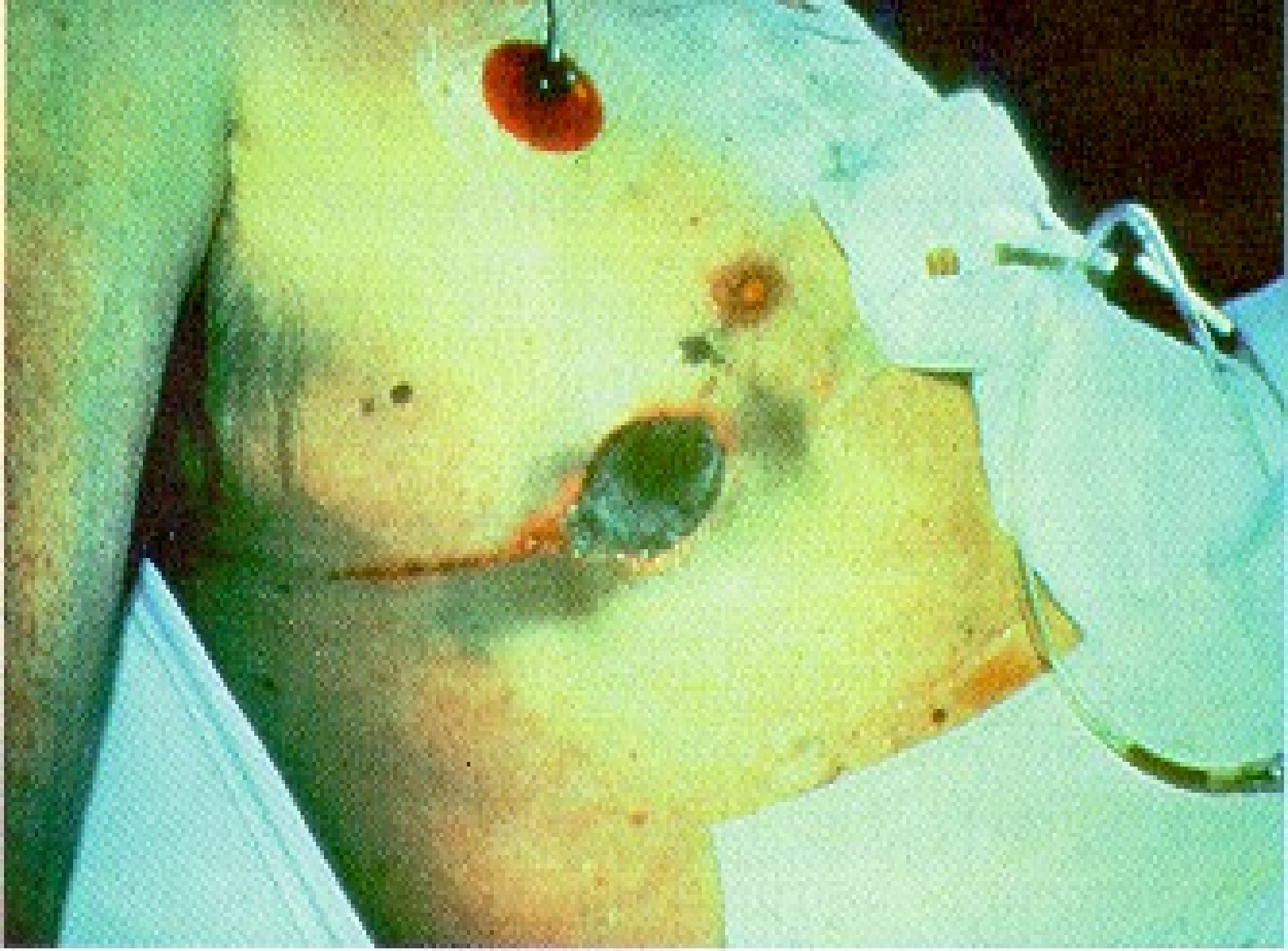
(1) Perforation of organs or blood vessels, i.e. intestines,

arteries.



(2) Bleeding from an area where tissue has been cut.

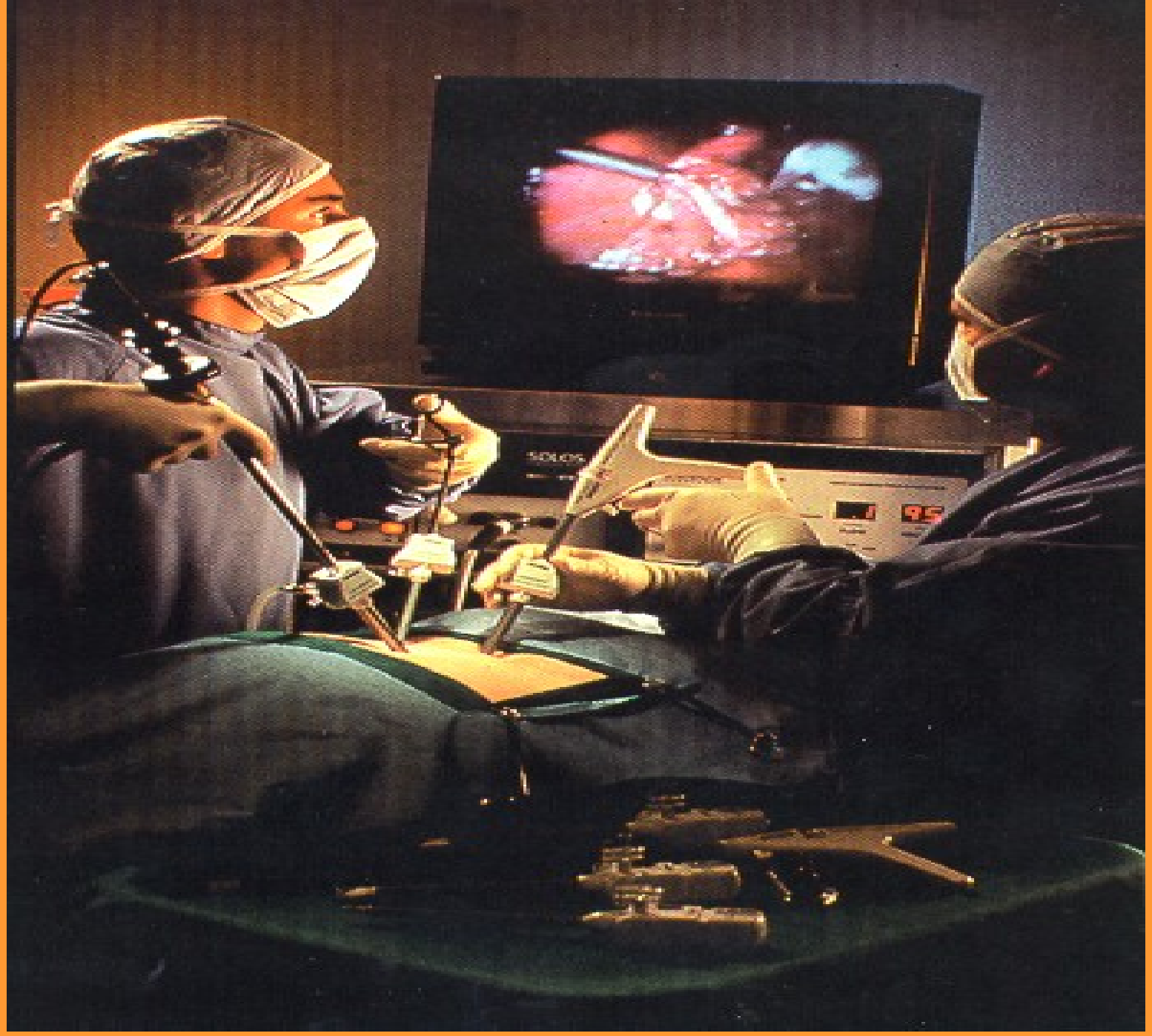
(3) Electrosurgical energy could leak from a break in the instrument insulation causing internal burns.



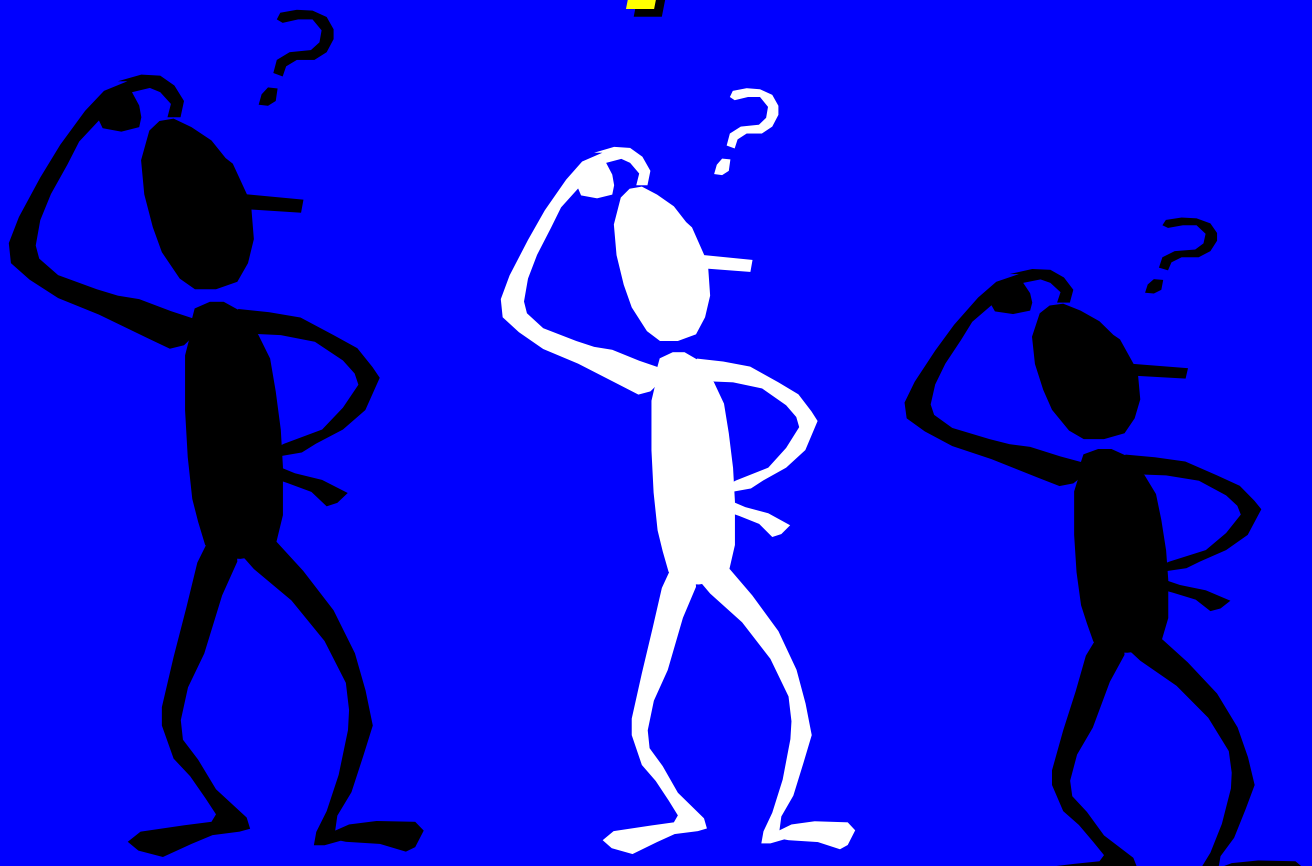
e. Surgeons may have:

(1) Restricted vision - Endoscopic surgery is performed with the surgeon looking through a lens or watching a monitor.

(2) Restricted mobility - surgeon has limited or difficult movement of instrumentation during endoscopic procedures.



Questions???



Take a Break!!!

Basic Types of Endoscopes

Endoscopes come in different diameters and lengths, based on specific patient and procedural requirement, but there are two basic types.

1. Flexible

2. Rigid

1. Flexible

   a. A one piece instrument that allows for limited bending when placed into a body cavity facilitating forward, side and retrograde visualization of the cavity.

(1) Scopes with hollow sheaths and an eyepiece and telescopic lens system that permit viewing in a variety of directions, such as bronchoscopes.

(2) Some sheaths are made of a plastic material.

(3) Flexible scopes have "built - in" light bundles.

b. Instruments are passed through working channels that partially comprise the body of the scope.

2. Rigid

a. A non - flexible instrument made of surgical stainless steel containing viewing optics.

b. Commonly consists of multiple components (scope,sheath, light cable, etc.)

c. Instruments are passed through a hollow working channel or access port into a body cavity in order to perform a procedure.

Components of Rigid Endoscope

The endoscope comes in different viewing angles, the angle of the lens used is determined by the position of the structure being viewed.

120 degree angle -

Retrospective view

90 & 70 degree angle

Lateral view

30 degree angle -

Forward oblique angle

0 degree - straightforward view

Sheaths and Trocars

Sheaths - Plastic or metal tubes that are inserted into the body to provide passageways for rigid scopes and instruments. (Also known as cannulas)

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Trocars - solid devices with a sharp or blunt point used to gain entry into the abdomen or a joint

(1) Used in conjunction with cannulas.

(2) Once cannula is inserted, trocar is removed and replaced with a scope or instrument.

Endoscopic Support Equipment

1. Light source
2. Camera
3. Monitors
4. Video Cassette Recorder
5. Video Printer
5. Insufflator
6. Fluid Pump
7. Operative Instrumentation

stryker
ENDOSCOPY
780 MEDICAL VIDEO CAMERA
CAMERA
COLOR ADJUSTMENT
RED
BLUE
MANUAL
AUTO
WHITE BALANCE
POWER
COLOR CONTROL
3CHIP

Valleylab
FORCE 40

WOLF
RICHARD WOLF
MEDICAL INSTRUMENTS CORP.
ROSEMONT, ILLINOIS 60018
AUTOMATIC
CO2-INSUFFLATOR
2043
CO2 CYLINDER CONTENTS
CO2-VOLUME CONSUMED
INTRA-ABDOMINAL PRESSURE
CAUTION: FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PRACTITIONER LICENSED BY THE LAW OF THE STATE IN WHICH HE PRACTICES TO USE OR ORDER THE USE OF THE DEVICE.
MANUAL
ON
ON
OFF
AUTOMATIC
INSUFFLATION
VISUAL GAS-FLOW CONTROL
to PATIENT
FILL INTERNAL TANK
INSUFFLATE

POWER
OFF
ON
Karl Storz
TWIN COLD LIGHT
MODEL 486 B
MADE IN U.S.A.
INCREASE
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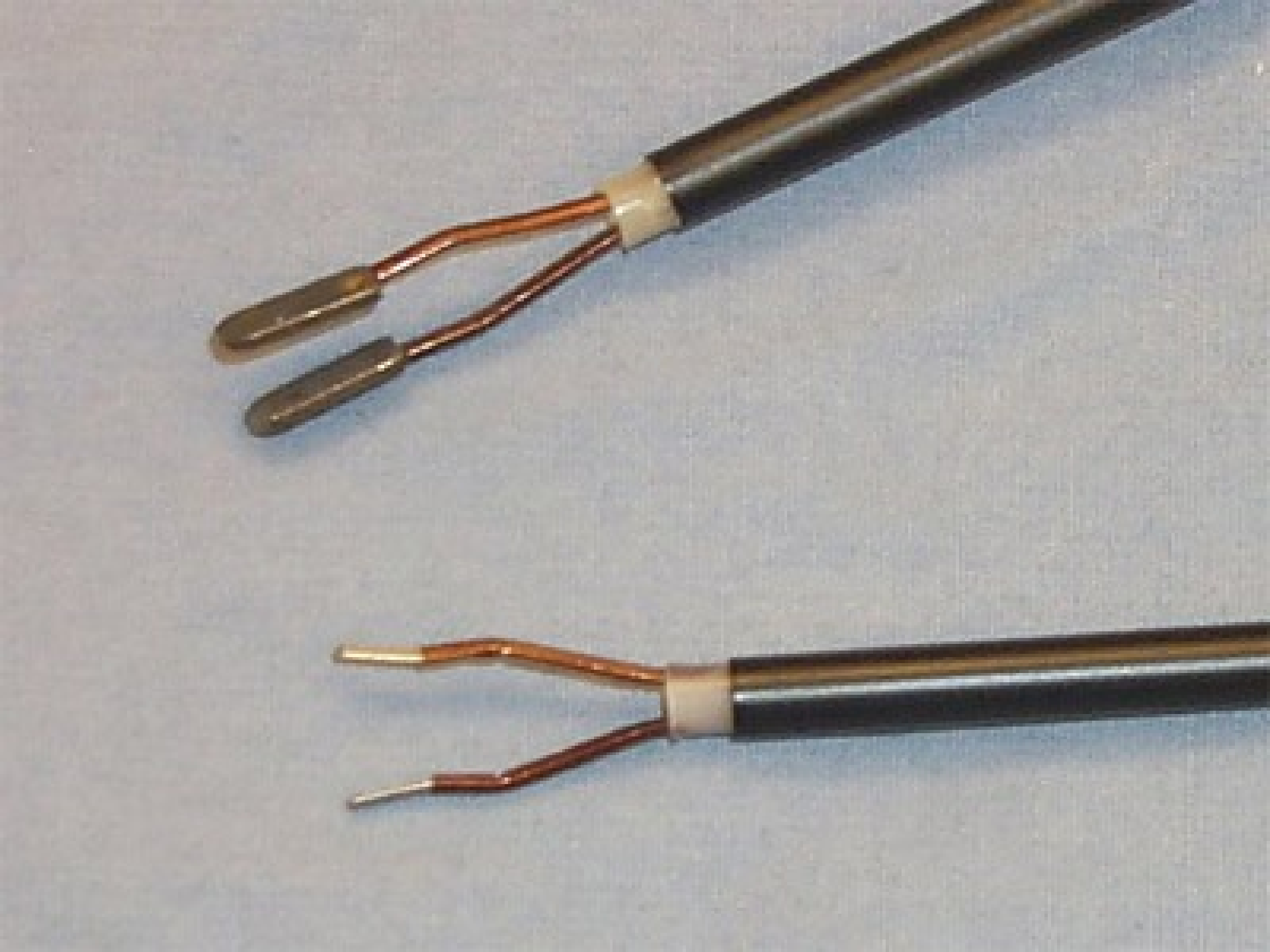
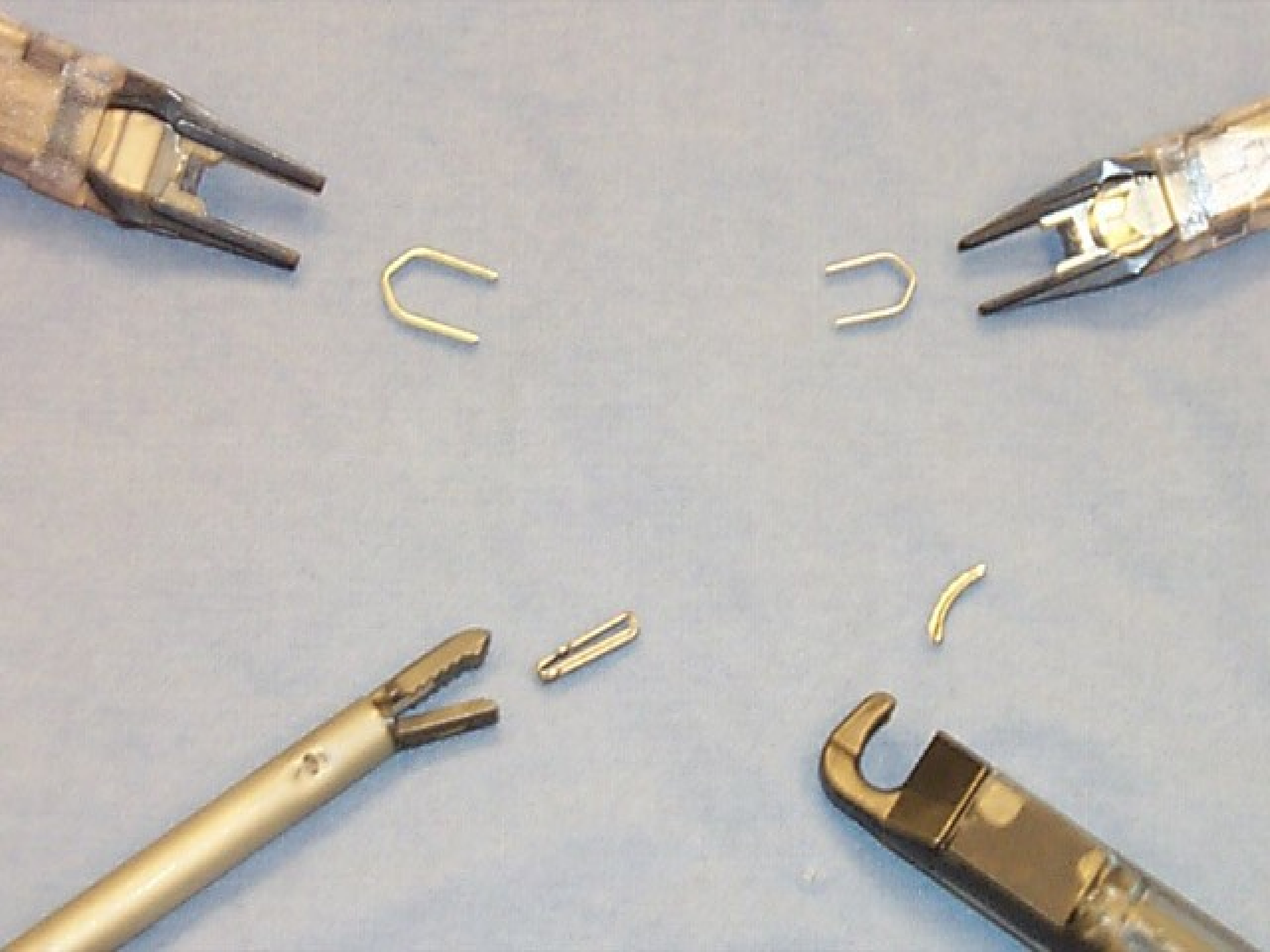
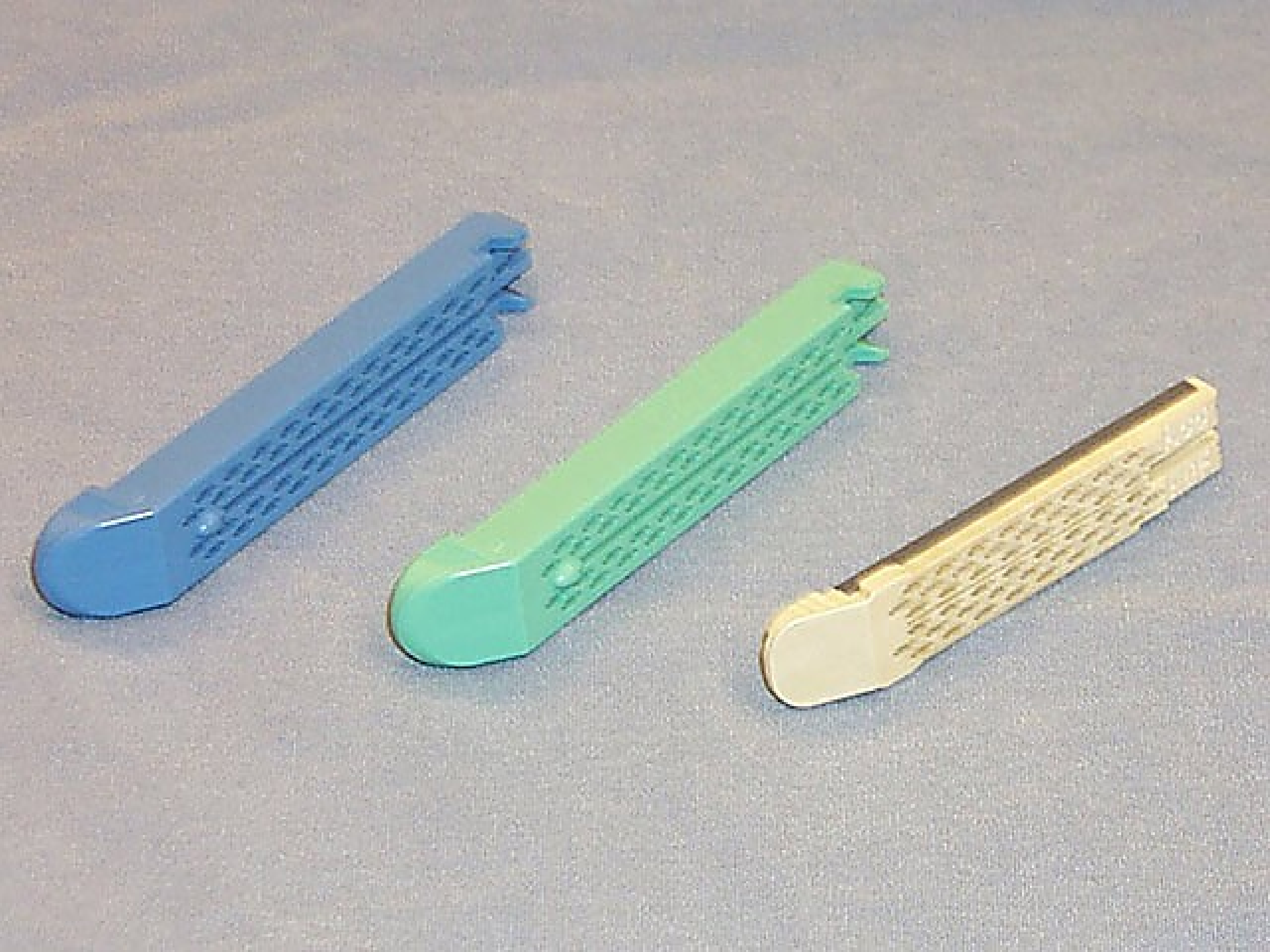
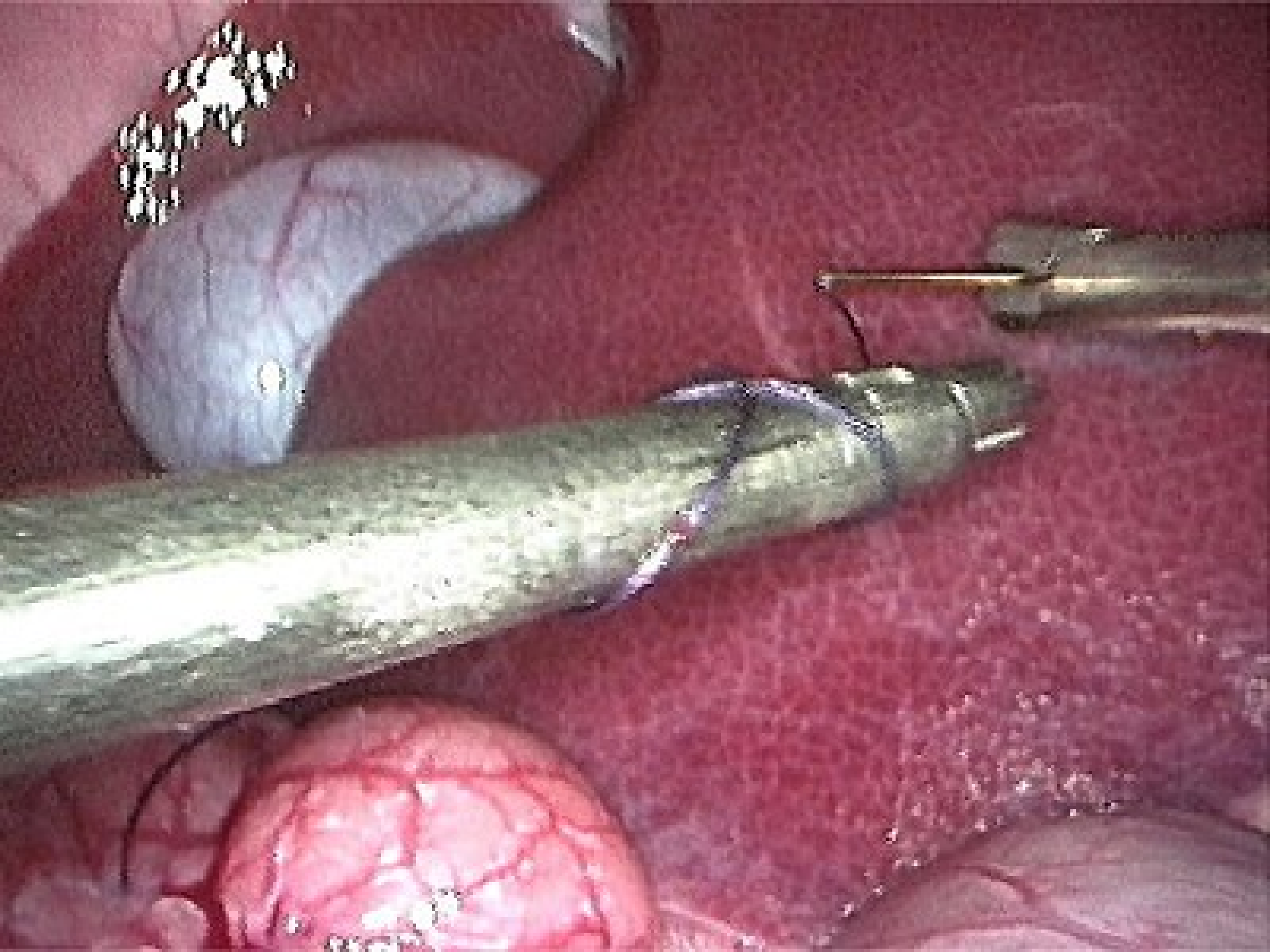








Draping Materials

Usually case specific.

Laparoscopy,
Arthroscopy

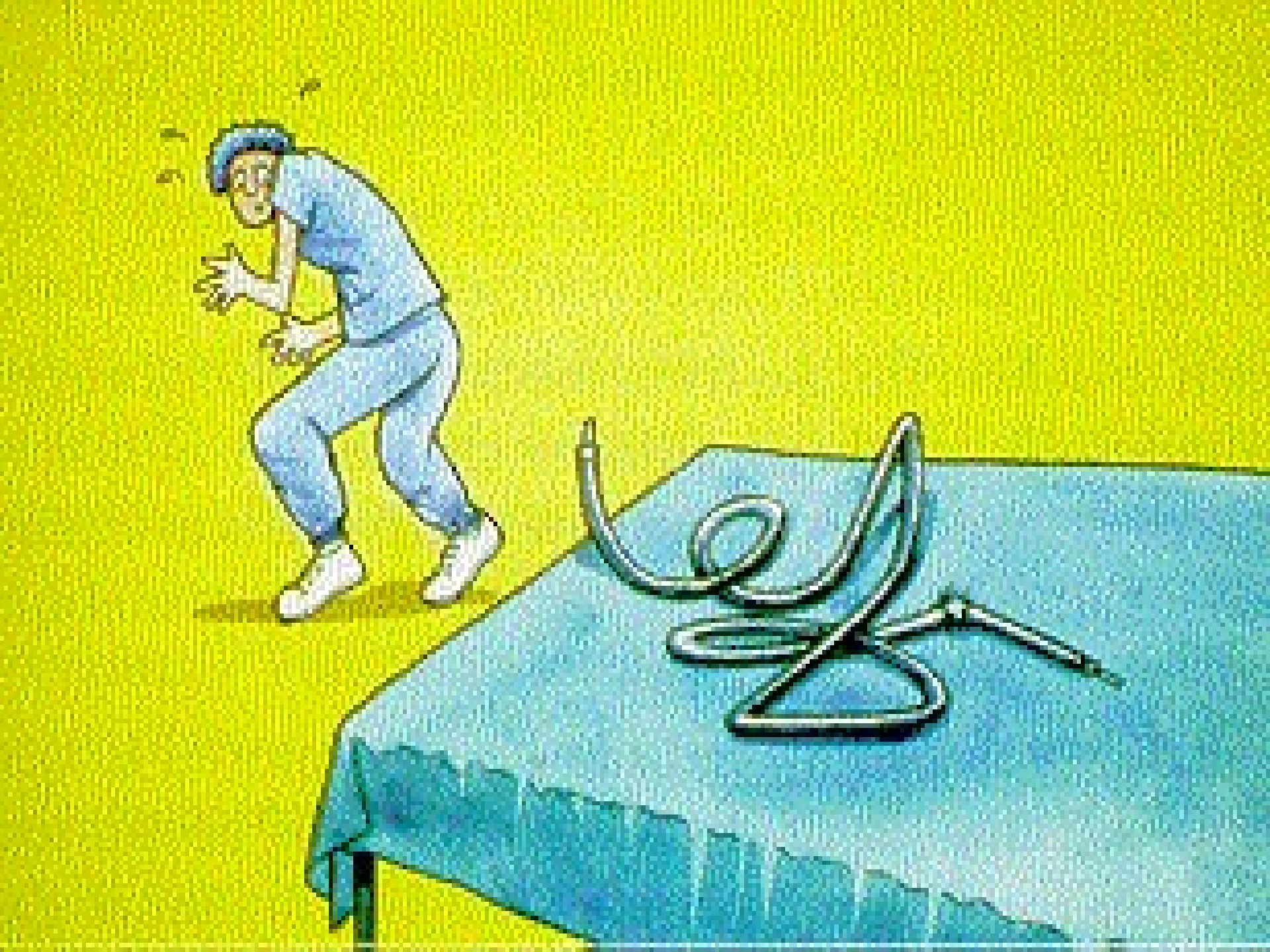
Hysteroscopy, etc.

Processing Endoscopes and Endoscopic Instruments for Sterilization

1. During procedure - Blood and tissue should be removed by wiping them with a sponge soaked in sterile water.
2. Post-operative cleaning and decontamination should occur immediately after the completion of the procedure.

a. Manually clean scopes and accessories w/ manufacturer's recommended solution.

b. Suction/biopsy ports and channels of flexible scopes should be flushed to prevent drying of operative secretions.



c. All scopes and accessories must be fully disassembled to ensure that crevices, joints, and channels have been thoroughly cleaned.

CAUTION

Manufacturer's written instructions should be followed when selecting a cleaning detergent to be used on all scopes and accessories.

d. Instruments with channels should be flushed with cleanser using a syringe. This prevents air from being trapped inside the instrument and allows for greater surface contact by cleaner.

CAUTION

Abrasives, hard brushes and cleaning compounds are not to be used because they scratch the instrument surface and lens, contributing to corrosion and impede sterilization.

3. A cycle in the ultrasonic cleaner will enhance the removal of debris from hard to reach places on scopes and instruments.

4. Sterilization -

a. ETO - most preferred method for scopes.

b. Steam - more endoscopes are being manufactured to endure this process. (Steam is not recommended for for older scopes and light cords.)

c. Peracetic acid - Latest innovation, allows for quick turnover.

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Common Endoscopic Procedures

1. Diagnostic laparoscopy - examination of the abdominal cavity to confirm diagnosis or rule out medical conditions.
2. Laparoscopic Bilateral Tubal Ligation (BTL) - occlusion of the fallopian tubes using clips, sutures, or cauterization.

3. Laparoscopic Cholecystectomy - Endo - scopic removal of the gallbladder.

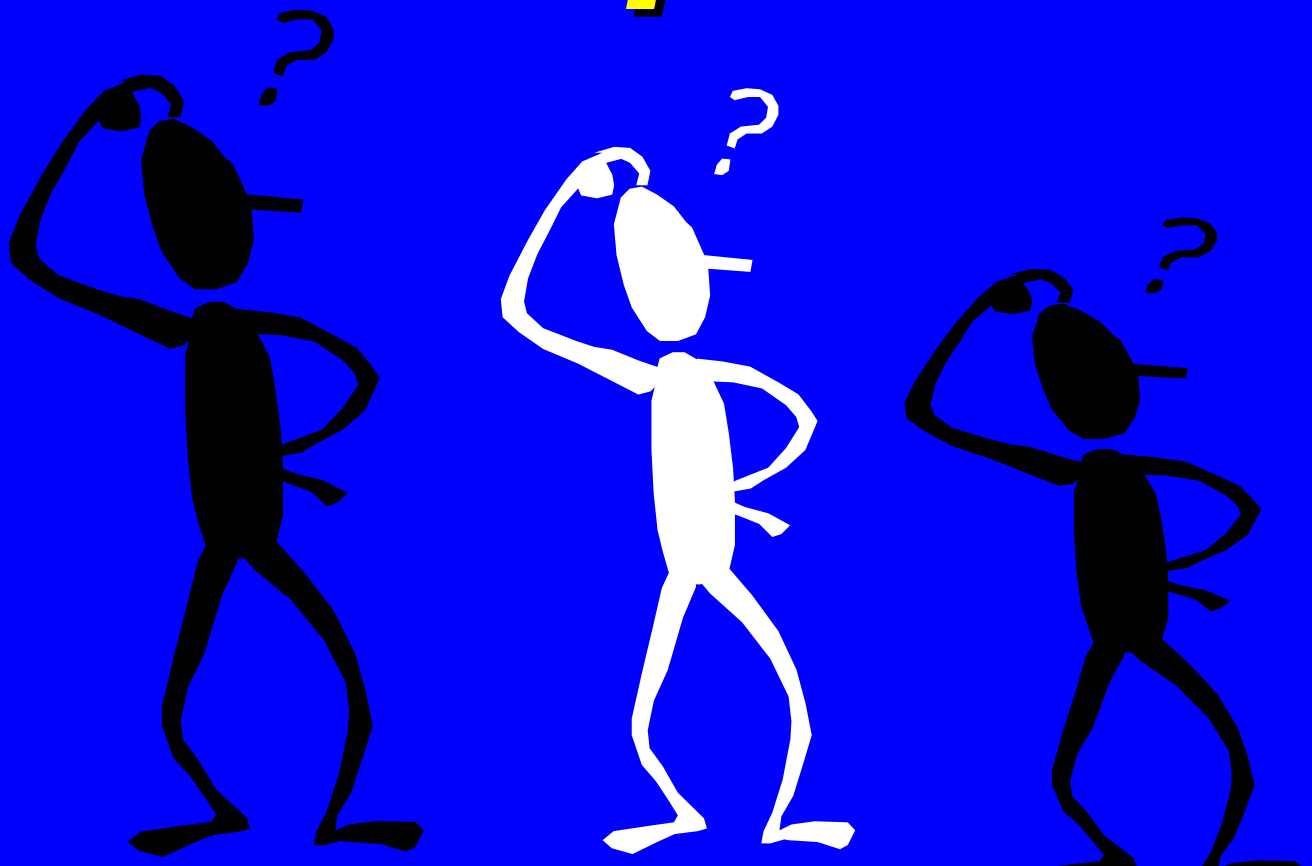
4. Laparoscopic Appendectomy - Endo - scopic removal of the appendix.

5. Laparoscopic Herniorrhaphy - Endoscopic repair of a hernia.

6. Arthroscopy - Endoscopic examination of a joint.

7. Bronchoscopy - direct visualization of the trachea and bronchi performed for diagnosis and for treatment by use of a flexible or rigid endoscope.

Questions???



Take a Break!!!